What is claimed is:

1. A 1-DOF bending mechanism with a multi-slider linkage mechanism in which the multiple frames are arrayed linearly and mounted to be rotatable on each adjacent frame about a rotary shaft; drive links and restraining links are mounted to be rotatable and slidable on one side and on the other side, respectively, of the frames viewed from said rotary shaft; and said drive links are slid by power forward and backward to effect the bending motion for the frames.

2. A 1-DOF bending mechanism with a multi-slider linkage mechanism as claimed in Claim 1 in which said multiple frames comprise the first, the second and the third frames; the first and the second frames and the second and the third frames are connected to be rotatable with each other by the first and the second rotary shaft, respectively; and the first and the second frames can be bent relative to the third frame.

3. A 1-DOF bending mechanism with a multi-slider linkage mechanism as claimed in Claims 1 or 2 in which the top of the first drive link is mounted to be rotatable on the first frame on its one side viewed from the first rotary shaft by the first pin; the bottom of the first drive link is mounted to be rotatable on the top of the second drive link by the second pin; said second pin is then fitted into the first slot formed on the second frame; the bottom of said second drive link is mounted to be rotatable on the top of the third drive link by the third pin; said third pin is then fitted into the second slot formed on the third frame; the bottom of the third drive link is directly connected to an actuator; said actuator is connected to a power source; in which the top of the first restraining link is mounted to be rotatable on the first frame on its other side viewed from the first rotary shaft by the fourth pin; the bottom of the first restraining link is mounted to be rotatable on the top of the second restraining link by the fifth pin; said fifth pin is then fitted into the third slot formed on the second frame; the bottom of said second restraining link is mounted to be rotatable by the sixth pin; and said sixth pin is then fitted into the fourth slot formed on the third frame.

4. An MDOF bending mechanism with a multi-slider linkage mechanism comprising two 1-DOF bending mechanisms with a multi-slider linkage mechanism in which, in each of said bending mechanisms, multiple frames are arrayed linearly and each frame is mounted to be rotatable on the adjacent frame about a rotary shaft;

drive links and restraining links are mounted to be rotatable on one side and on the other side of the frames as viewed from the rotary shaft, respectively; said drive links are slid by power in the serial direction to effect the bending motion of the multiple frames; and said two 1-DOF bending mechanisms with a multi-slider linkage mechanism are connected to each other with a phase difference of 90 degrees to effect MDOF bending motion.

5. An MDOF bending mechanism with a multi-slider linkage mechanism as claimed in Claim 4 in which the multiple frames of one of said two 1-DOF bending mechanisms comprises the first, the second and the third frames; the first and the second frames and the second and the third frames are connected to be rotatable with each other about the first and the second rotary shaft, respectively; the first and the second frames can be bent relative to the third frame; and in which the multiple frames of the other of said two 1-DOF bending mechanisms comprises the fourth and the fifth frames which are connected to be rotatable with each other about the fourth rotary shaft; and the fourth frame of the other of the two 1-DOF bending mechanisms is connected to the third frame of one of the two 1-DOF bending mechanisms about the third rotary shaft with a phase difference of 90 degrees.

6. An MDOF bending mechanism with a multi-slider linkage mechanism as claimed in Claims 4 or 5 in which, on the first frame on its one side viewed from the first rotary shaft, the top of the first drive link is mounted to be rotatable by the first pin; the bottom of the first drive link is mounted to be rotatable on the top of the second drive link by the second pin; said second pin is then fitted into the first slot formed on the second frame; the bottom of said second drive link is mounted to be rotatable on the top of the third drive link by the third pin; said third pin is then fitted into the second slot formed on the third frame; the bottom of the third drive link is connected to an actuator by pins via drive links; said actuator is connected to a power source; in which, on said first frame on its other side viewed from the first rotary shaft, the top of the first restraining link is mounted to be rotatable by the fourth pin; the bottom of the first restraining link is mounted to be rotatable on the top of the second restraining link by the fifth pin; said fifth pin is then fitted into the third slot formed on the second frame; the bottom of said second restraining link is mounted to be rotatable by the sixth pin; said sixth pin is then fitted into the fourth slot formed on the third frame; in which, furthermore, the fourth frame is mounted to be rotatable on said third frame about the third rotary shaft that is installed with a phase difference of

90 degrees relative to the first and the second rotary shafts; the fifth frame is mounted to be rotatable on the fourth frame about the fourth rotary shaft; the frames are arrayed linearly; in which, on one side of said third frame viewed from the third rotary shaft, the top of the fourth drive link is mounted to be rotatable by the seventh pin; the bottom of the fourth drive link is mounted to be rotatable on the top of the fifth drive link by the eighth pin; said eighth pin is then fitted into the fifth slot formed on the fourth frame; the bottom of said fifth drive link is mounted to be rotatable on the top of the sixth drive link by the ninth pin; said ninth pin is then fitted into the sixth slot formed on the fifth frame; the bottom of the sixth drive link is directly connected to an actuator which transmits energy from the power source to the fifth drive link; in which, on the other side of said fourth frame viewed from the third rotary shaft, the top of the third restraining link is mounted to be rotatable by the tenth pin; the bottom of the third restraining link is mounted to be rotatable on the top of the fourth restraining link by the eleventh pin; said eleventh pin is then fitted into the seventh slot formed on the fourth frame; the bottom of said fourth restraining link is mounted to be rotatable by the twelfth pin; and said twelfth pin is then fitted into the eighth slot formed on the fifth frame.

7. An MDOF bending mechanism with a multi-slider linkage mechanism as claimed in any of Claims 1 through 6 in which each of said multiple frames is provided with a through-hole at the center and four (4) additional through-holes arranged around the circumference of the central through-hole.

8. An MDOF bending mechanism with a multi-slider linkage mechanism as claimed in any of Claims 1 through 7 in which on said multiple frames arrayed linearly the linkage for vertical bending and that for horizontal bending are alternately installed in said four (4) through-holes arrayed around the circumference of the central through-hole and a pair of forceps, endoscope or other equipment for manipulation is set in the central through-hole on the leading frame.

9. An MDOF bending mechanism with a multi-slider linkage mechanism as claimed in any of Claims 1 through 8 in which the power source for the actuator to slide the frames is a hydraulic, oil-hydraulic or air-pressure cylinder or similar apparatus; said actuator is connected to a control system by a wired or a wireless system with cables or interface to enable remote control and the optimum system is selected according to the application; and the location, speed, acceleration or force is fed back using sensors.

10. An MDOF bending mechanism with a multi-slider linkage mechanism as claimed in any of Claims 1 through 9 in which said control system is designed to operate the actuator and control the location and position of and perform the kinematic calculation for the end effector, which may be a controlling calculator, a personal computer, a microprocessor or similar device that is selected according to the expected volume of data to be processed and the operating environment (power supply, footprint, etc.); the remote control system uses leased lines or existing networks to control the system remotely; and the operating interface may be a handheld, navigation or master-slave type or similar device that is selected according to the application.